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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.             | CONFIRMATION NO.            |
|---|-------------|----------------------|---------------------------------|-----------------------------|
| 10/595,614  | 05/02/2007  | Noriaki Sanada       | 029567-00008                    | 3590                        |
| 4372  | 7590        | 09/22/2009           |                                 |                             |
| ARENT FOX LLP<br>1050 CONNECTICUT AVENUE, N.W.<br>SUITE 400<br>WASHINGTON, DC 20036 |             |                      | EXAMINER<br>LOGIE, MICHAEL J    |                             |
|   |             |                      | ART UNIT<br>2881                | PAPER NUMBER                |
|   |             |                      | NOTIFICATION DATE<br>09/22/2009 | DELIVERY MODE<br>ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DCIPDocket@arentfox.com  
IPMatters@arentfox.com  
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|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/595,614 | <b>Applicant(s)</b><br>SANADA ET AL. |  |
|                              | <b>Examiner</b><br>MICHAEL J. LOGIE  | <b>Art Unit</b><br>2881              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-5 and 7-11 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-5 and 7-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/11/2009</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

An "Amendment" was received on 27 July 2009, in response to Office Action of 27 March 2009. Claims 1 and 6 have been cancelled. Claims 2, 3, 7 and 8 have been amended. Claim 11 has been newly added. Claims 2-5 and 7-11 are now pending.

### ***Response to Arguments***

Applicant's arguments with respect to claims 2-5 and 7-11 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2-5 and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Okuda et al. (US patent no. 5,635,455).

In regards to claim 2-5 and 8-10, Okuda et al. teach an electron spectroscopy analysis method for executing a desired analysis with respect to a depth direction of a sample to be analyzed by irradiating a high-energy particle to said sample to be analyzed under a vacuum atmosphere, and detecting a number and a kinetic energy of electrons emitted from said sample to be analyzed on the basis of a photoelectric effect

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(col. 11, lines 46-59, note: "In FIG. 13 is shown the composition profile of the device in its thickness direction (corresponding to the sputtering time) as obtained by the Auger electron spectroscopy. The profile pattern proves that C.sub.60 /In layer 31 has a composition of In.sub.5-6 C60"), wherein the method comprises steps of ionizing a fullerene (fig. 8, 52), irradiating the fullerene ionized to the surface of said sample to be analyzed (note: dotted line coming out of source 52 towards sample 1) before irradiating the high-energy particle to said sample to be analyzed (Auger electron spectroscopy is done after the C60 has been deposited on the sample as discussed in col. 11, lines 46-59), and etching the surface of said sample to be analyzed (note layer 32 in figure 7 is the etched C60 layer on the substrate).

Claims 7 is the apparatus of claim 1 and is taught by Okuda et al. as described above.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-5 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coxon et al. (US patent no. 5,665,967), and further in view of Hill et al. (GB 2386747 A) (as submitted in IDS of 08/11/2009).

In regards to claim 2-5 and 8-10, Coxon teaches an electron spectroscopy analysis method (inherent in the apparatus of figure 1) for executing a desired analysis with respect to a depth direction of a sample to be analyzed by irradiating a high-energy particle to said sample to be analyzed under a vacuum atmosphere (x-ray source 1 irradiates sample 2 to provide photoelectrons in the depth direction to energy analyzer 17 all within the vacuum chamber 4), and detecting a number and a kinetic energy of electrons emitted from said sample to be analyzed on the basis of a photoelectric effect (col. 3, lines 13-15 teach the detection of the number of electrons and col. 6, lines 60-65 teach detecting the energy of the electrons emitted from the sample), wherein the method comprises steps of ionizing, irradiating the ionized to the surface of said sample to be analyzed (col. 7, lines 65-67 through col. 8, lines 1-7 teach irradiating with an ion gun to form secondary ions for SIMS analysis when in SIMS mode) before irradiating the high-energy particle to said sample to be analyzed (i.e. when in electron spectroscopy mode, since there are two modes of operation, the ion gun or the electron source could be activated depending on the analysis technique chosen to be used first), and etching the surface of said sample to be analyzed (implicit function of the ion gun 8).

Coxon differs from the claimed invention by not disclosing ionizing a fullerene, irradiating the fullerene ionized to the surface.

Hill et al. teach ionizing a C60 fullerene, irradiating the fullerene ionized to the surface of said sample to be analyzed (note: page 2, the first two full paragraphs).

Hill modifies Coxon by teaching a fullerene ion gun for the SIMS Mode.

Since both Coxon and Hill teach SIMS analysis, it would be obvious to one of ordinary skill in the art to have the ion source of Hill as the source of Coxon because the source brightness is sufficient to allow the production of an ion beam with a sufficiently small spot size and sufficiently high current to be used in SIMS applications.

Claims 7 is the apparatus of claim 1 and is taught by Coxon in view of Hill as described above.

In regards to claim 11, Coxon differs from the claimed invention by not disclosing wherein there is a fullerene supply device operably connected to the ion gun.

Hill et al. teaches wherein there is a fullerene supply device operably connected to the ion gun (cylindrical reservoir 2 seen in figure 1).

Hill modifies Coxon by teaching a fullerene ion gun for the SIMS Mode.

Since both Coxon and Hill teach SIMS analysis, it would be obvious to one of ordinary skill in the art to have the ion source of Hill as the source of Coxon because the source brightness is sufficient to allow the production of an ion beam with a sufficiently small spot size and sufficiently high current to be used in SIMS applications.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pertinent prior art is closely related art that individually or in combination could be considered grounds for rejection.

The first reference of note is Watson et al. (US pgPub 2003/0080292) which teach electron spectroscopy for depth profiling. Figure 1 shows an electron spectroscopy apparatus (1) with an analyzer (7), an x-ray source (9) operable to irradiate the sample (2) with x-rays (6) resulting in the escape of photoelectrons (8) therefrom. The device further has an ion source (10) operable to provide ions (11), for removal of material from the sample (2) positioned at the analysis plane (3) during material removal intervals. Such removal of material results in sample surfaces at one or more progressively deeper depths of the sample (2).

The second reference of note is Hoehn et al. (US patent no. 6,743,481) which teaches depositing multilayer coatings of fullerene molecules onto a substrate and removing the layers, leaving only a single layer thereof. Figure 2 shows the multilayers of fullerene molecules deposited onto the surface of a substrate (202). Figure 3 shows a source (250) (one of an electron, ion or laser source) to remove the multiple layers such that as seen in figure 4 only a single layer remains.

The third reference of note is Bhushan et al. (US patent no. 5,558,903) which teaches an improved synthesis of fullerene (C60) films, whereby improved purity and adhesion to a substrate are achieved.

See references cited for a listing of the pertinent prior art found and the prior art found.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Logie whose telephone number is 571-270-1616. The examiner can normally be reached on 7:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. J. L./

Examiner, Art Unit 2881

/ROBERT KIM/

Supervisory Patent Examiner, Art Unit 2881